HORUS440

Performance Test Report

Configure A
CPU: Intel Xeon Gold 5420+ (**205W**)
GPU: Nvidia RTX A4500 (**200W**)

Configure B
CPU: Intel Xeon Platinum 8558 (**330W**)
GPU: Nvidia RTX A4500 (**200W**)

Product Manager	R&D Leader	Mechanical Engineer	System Engineer	Test Engineer
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Revision Date: October 1, 2024

Performance Test

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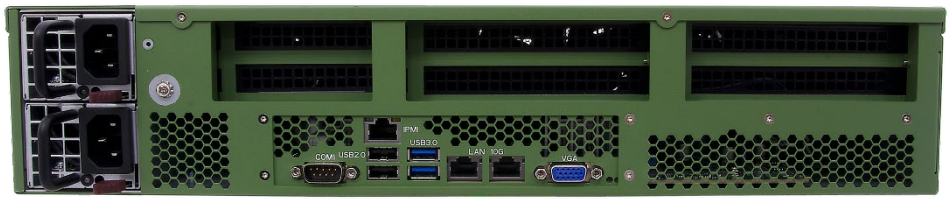

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1. SPECIFICATION

1-1. System Configuration A (Gold 5420+ / TDP: 205W)

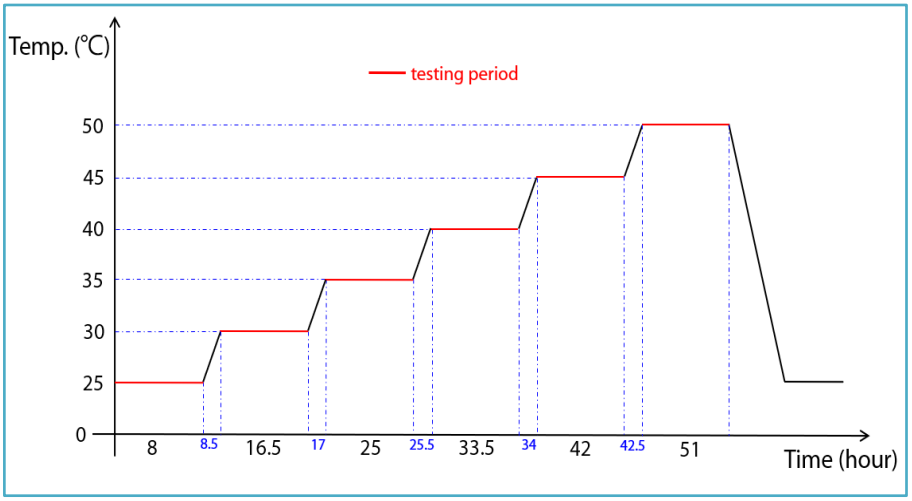
Motherboard	5th/4th Gen Intel® Xeon® Scalable processors, Single Socket LGA-4677 (Socket E) supported, CPU TDP supports Up to 350W TDP Intel C741® Chipset Up to 2TB 3DS ECC RDIMM, DDR5-5600MT/s (1DPC) in 8 DIMM slots 8 NVMe ports PCIe 5.0 x4 via 4 MCIO connectors
CPU	Intel® Xeon® Gold 5420+ Processor Total Cores: 28 Total Threads: 56 Max Turbo Frequency: 4.1 GHz Processor Base Frequency: 2.0 GHz Cache: 52.5 MB Intel® UPI Speed: 16 GT/s TDP: 205 W
Memory	2 x 8GB DDR5 R-DIMM
Storage	2x 960GB SATA SSD
GPU	Nvidia RTX A4500 GPU memory: 20GB GDDR6 NVIDIA Ampere architecture-based CUDA Cores: 7,168 NVIDIA third-generation Tensor Cores: 224 NVIDIA second-generation RT Cores: 56 Power consumption Total board power: 200 W
Power Module	800W Redundant Power Supply

1-2. System Configuration B (Platinum 8558 / TDP: 330W)

Motherboard	5th/4th Gen Intel® Xeon® Scalable processors, Single Socket LGA-4677 (Socket E) supported, CPU TDP supports Up to 350W TDP Intel C741® Chipset Up to 2TB 3DS ECC RDIMM, DDR5-5600MT/s (1DPC) in 8 DIMM slots 8 NVMe ports PCIe 5.0 x4 via 4 MCIO connectors
CPU	Intel® Xeon® Platinum 8558 Processor Total Cores: 48 Total Threads: 96 Max Turbo Frequency: 4.0 GHz Processor Base Frequency: 2.1 GHz Cache: 260 MB Intel® UPI Speed: 20 GT/s TDP: 330 W
Memory	2 x 8GB DDR5 R-DIMM
Storage	2x 960GB SATA SSD
GPU	Nvidia RTX A4500 GPU memory: 20GB GDDR6 NVIDIA Ampere architecture-based CUDA Cores: 7,168 NVIDIA third-generation Tensor Cores: 224 NVIDIA second-generation RT Cores: 56 Power consumption Total board power: 200 W
Power Module	800W Redundant Power Supply

2. TEST PLAN

2.1. THERMAL MEASUREMENT PROCESS

Test Purpose	The purpose of performing thermal profile testing is to identify potential thermal issues with the EUT. Considering that semiconductor failure rates rise rapidly with increasing junction temperature, it can aid product reliability assessment. As the system cools down, the mode will change with stack selection, temperature/heat. Mapping can help develop the best tracking arrangements.
Test Equipment	1. KSON THS-B4T-150 Chamber.
Quantity Tested	Minimum 1 Set
Test Software	1. Stress CPU: PassMark Burn-in Test Software Ver 9.0 2. Stress GPU: AIDA64 extreme 690
Test Procedure	1. Thermal pre-scan measurement: Temperature: **25℃～50℃** Humidity: **60%RH (Temperature above 25℃)** 2. Actual thermal measurement: 2-1. Select the test point based on the infrared photo and connect the thermocouple to the hot spot. 2-2. Place the EUT into the hot chamber and set the test temperature curve Specification. 2-3. Open the hot cell and power up the EUT, enter the Windows Server 2022 Standard Evaluation(Version 10.0.20348 Build 20348) environment and perform a maximum power test and stress test. 2-4. After the EUT executes the test software for 8 hours, record the maximum heat generation of each thermocouple point. 2-5. Turn off the hot cell and EUT. 2-6. Verify and check that the recorded information for each component complies with the operating temperature range listed in the specification/approval sheet for each component being tested.
Test Diagram of Curves	Environment defines for 51 hours. 

2.2. TEST RRESULT <TEST ITEM>

2.2.1. Temperature Cycle

Aging test of various parts at different temperatures under maximum load and full load conditions.

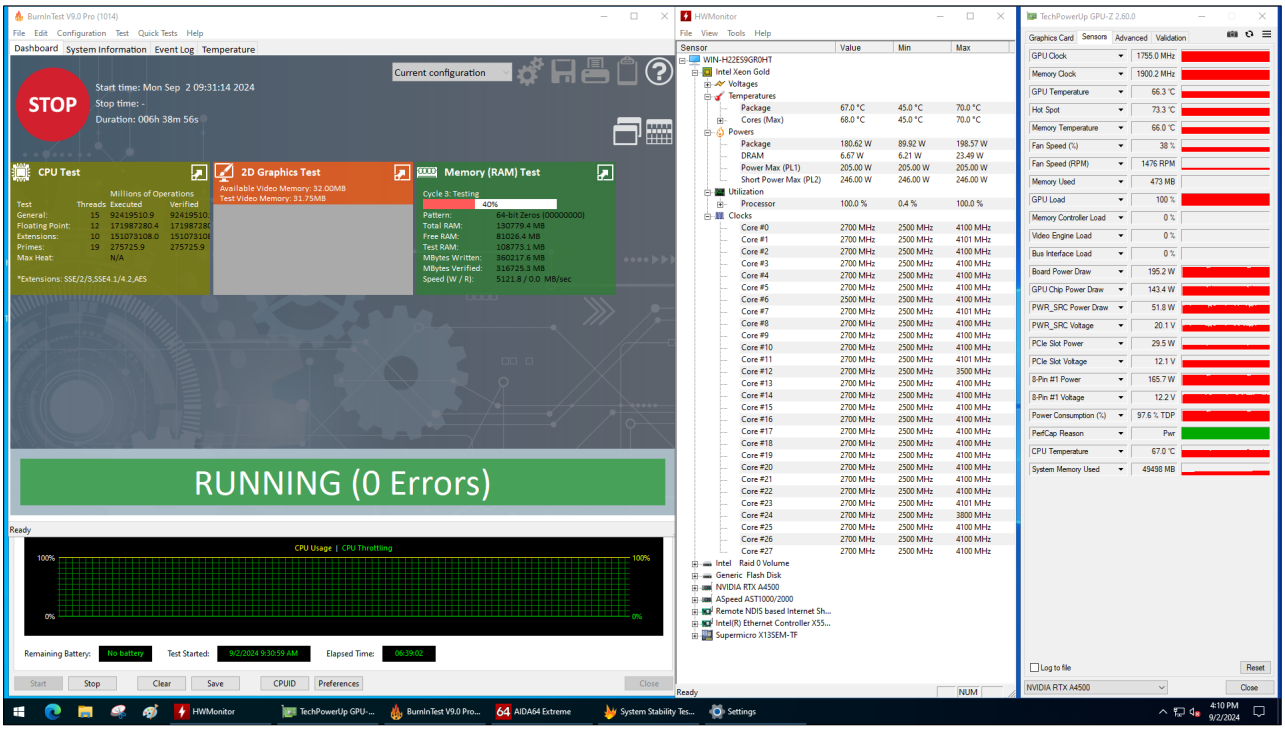
Test Temperature	Test Result
25˚C / 60%RH	PASS
30˚C / 60%RH	PASS
35˚C / 60%RH	PASS
40˚C / 60%RH	PASS
45˚C / 60%RH	PASS
50˚C / 60%RH	PASS

Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

3. TEST PHOTO IN LAB

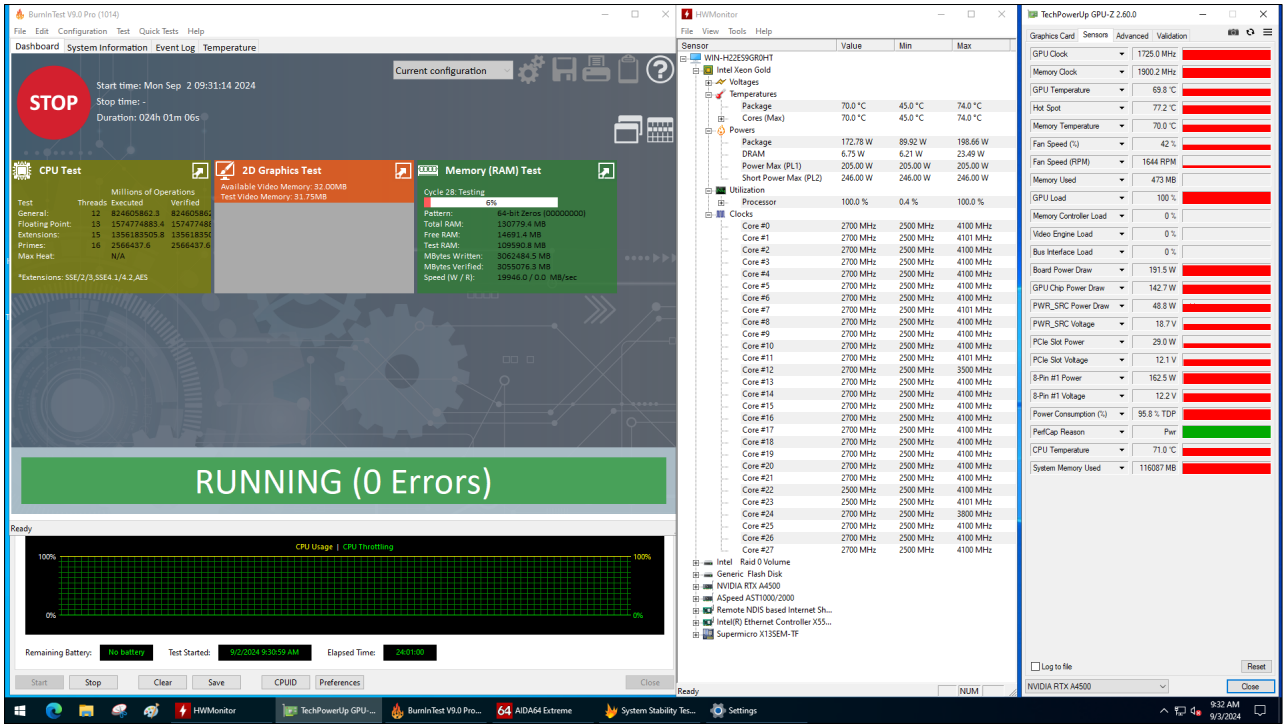
- Chamber in 25°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

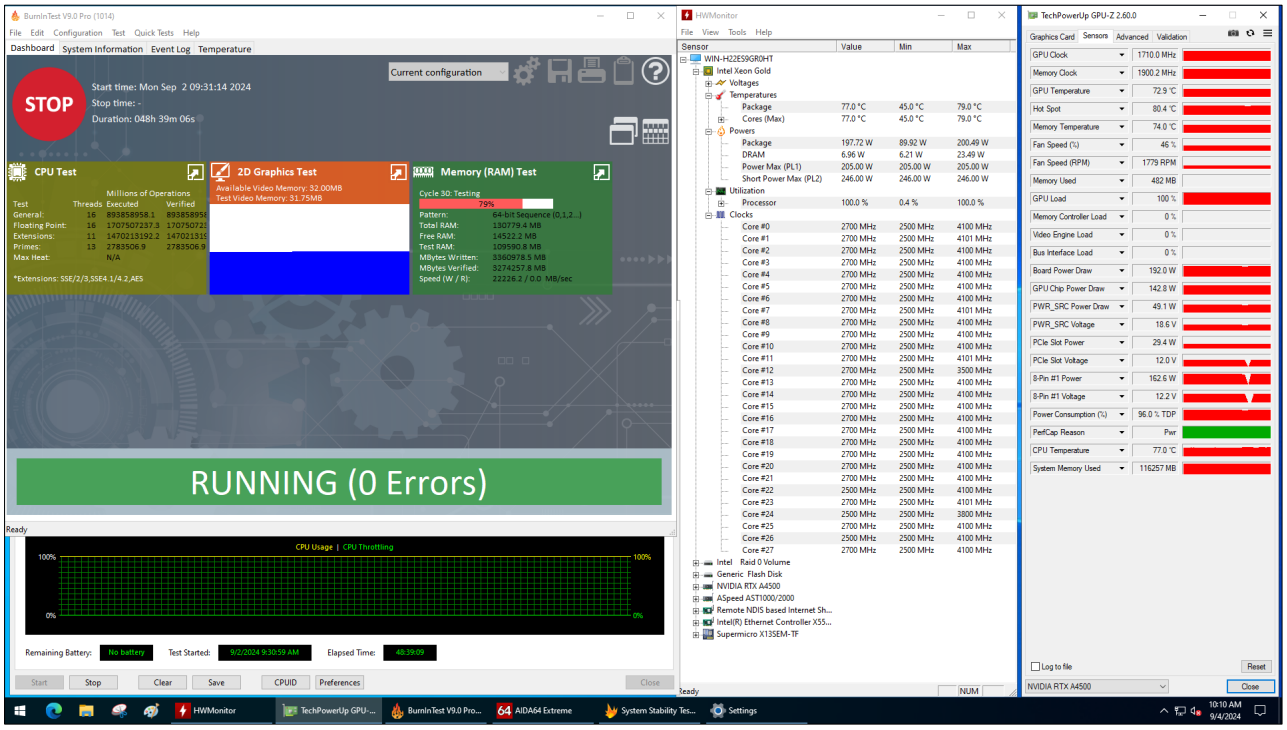
- Chamber in 30°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

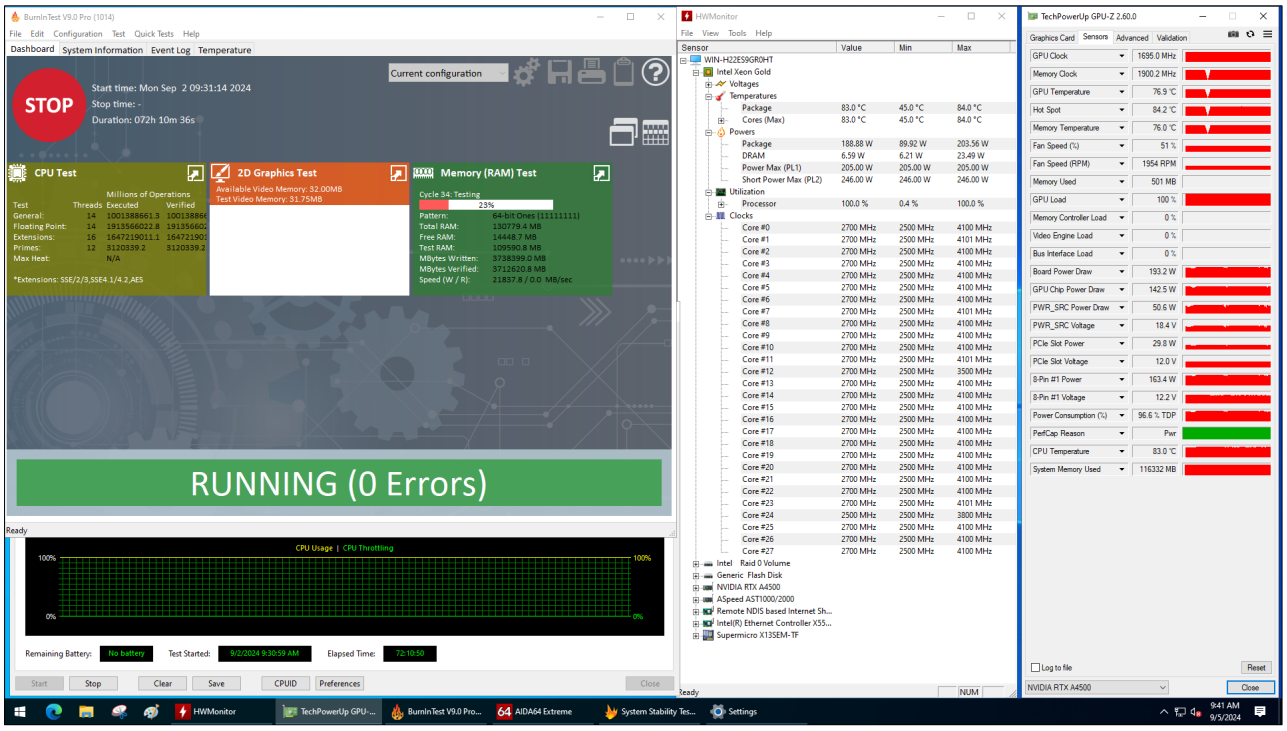
- Chamber in 35°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

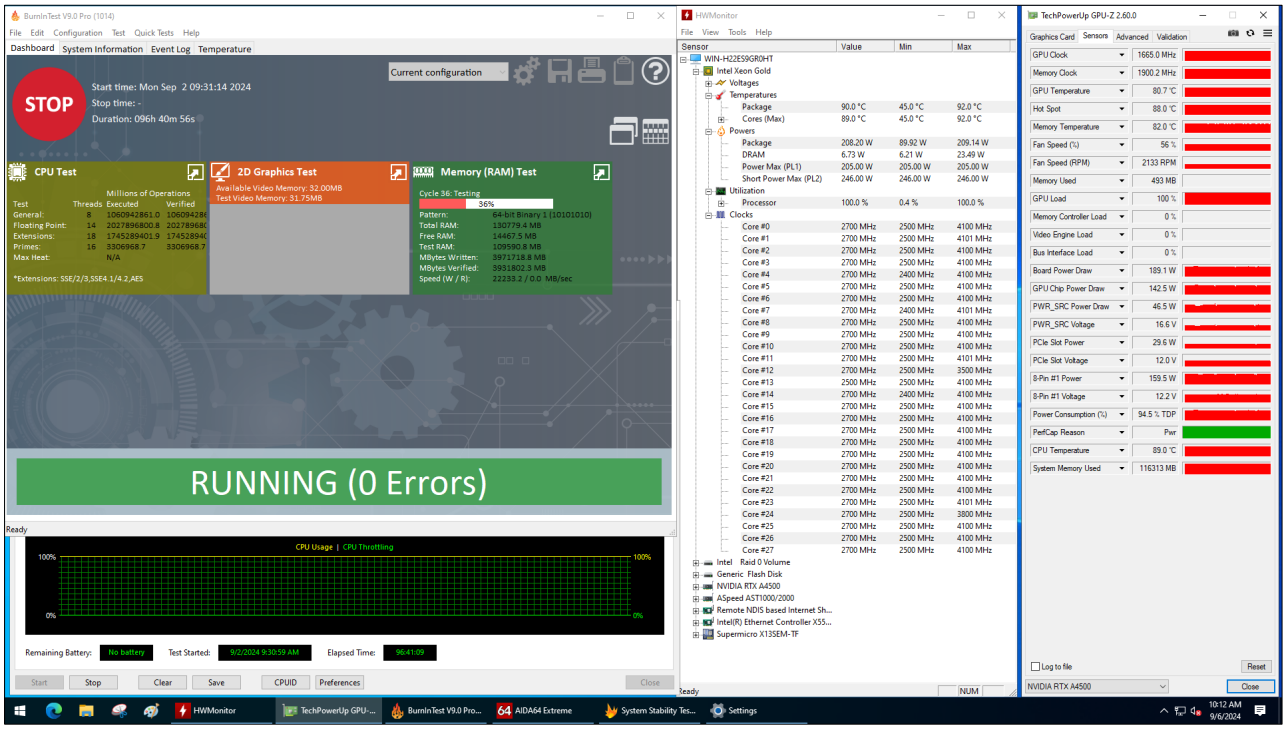
- Chamber in 40°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

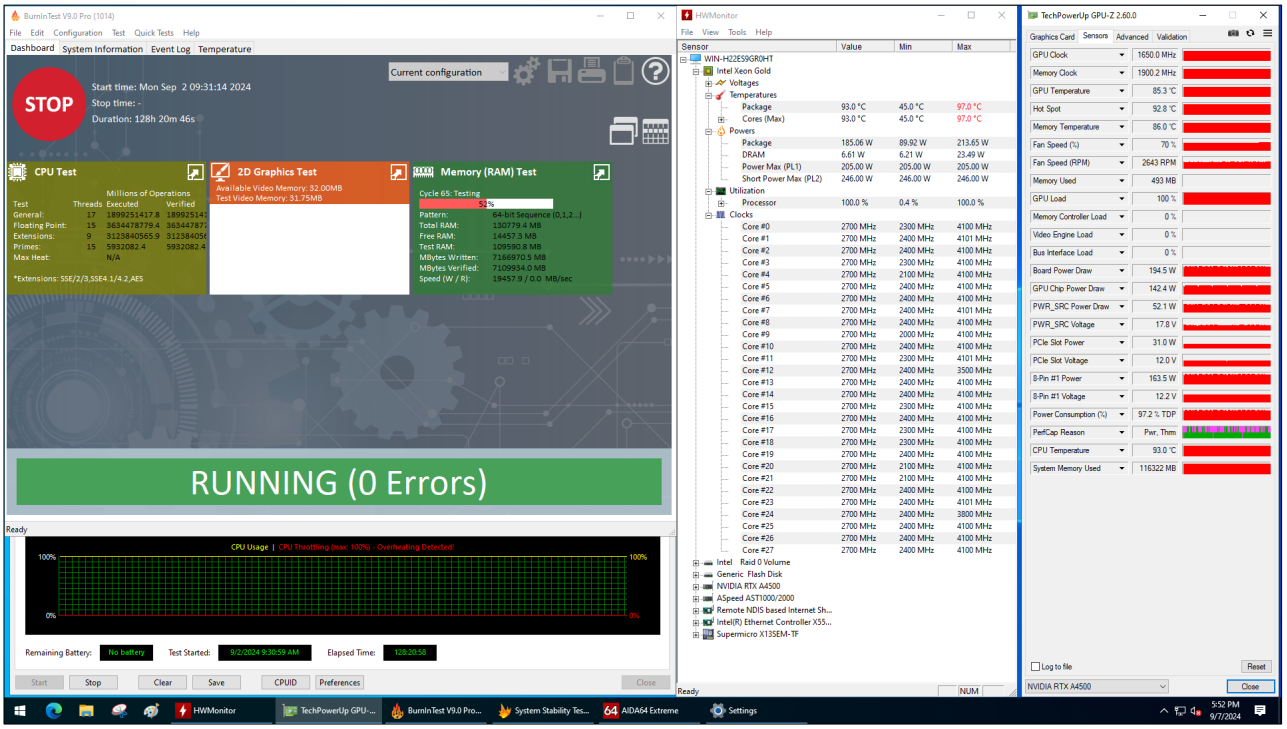
- Chamber in 45°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

- Chamber in 50°C / 60%RH

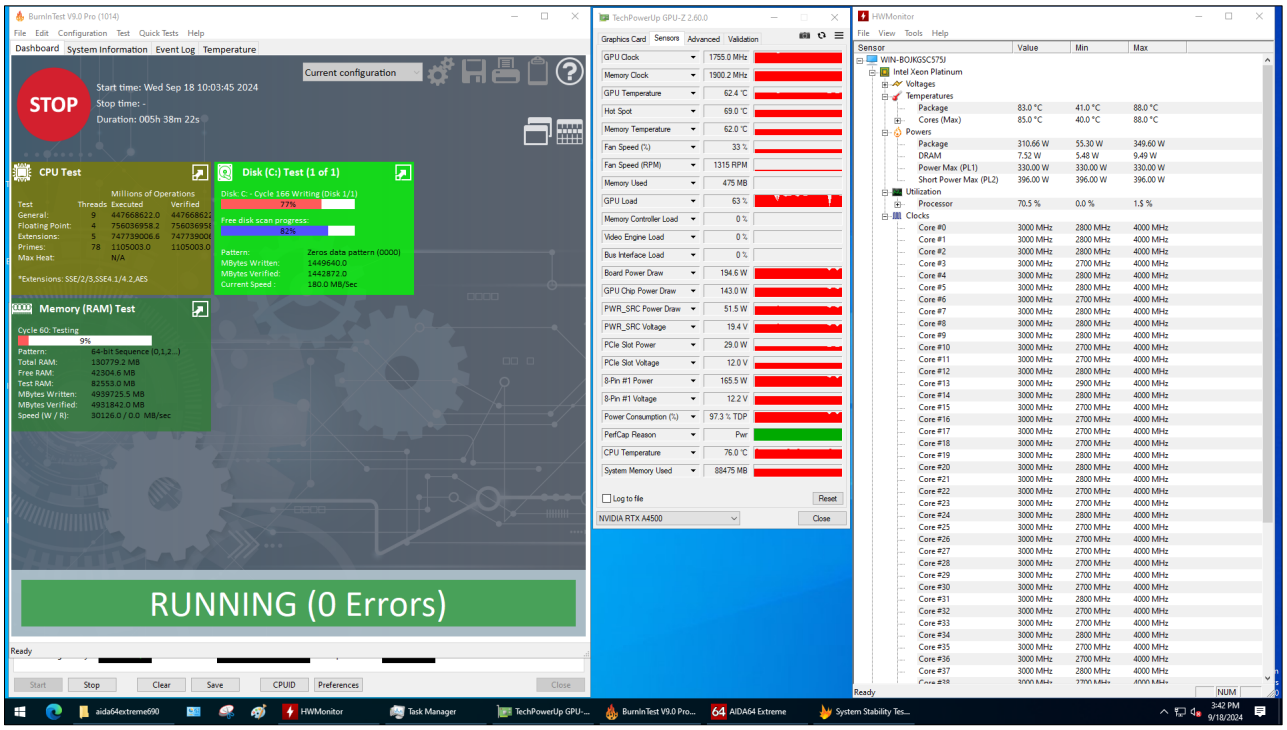


Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

4. TEST PHOTO IN LAB

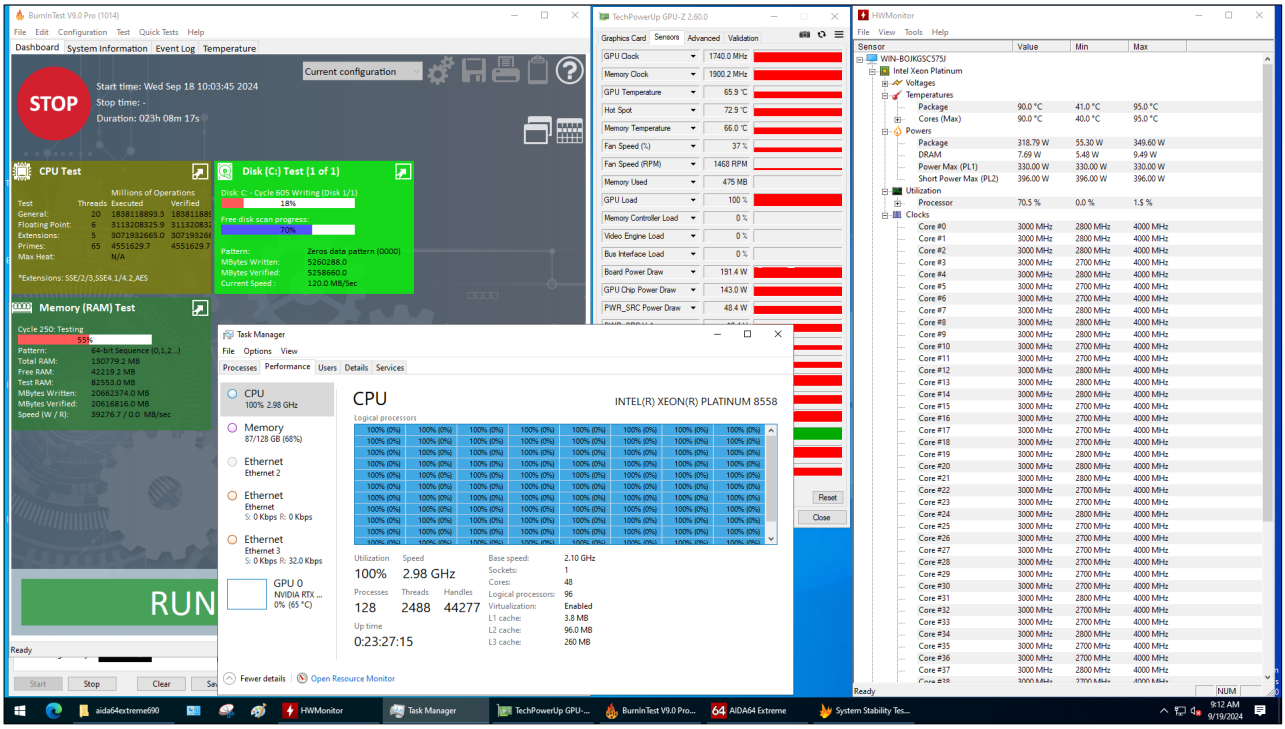
- Chamber in 25°C / 60%RH



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

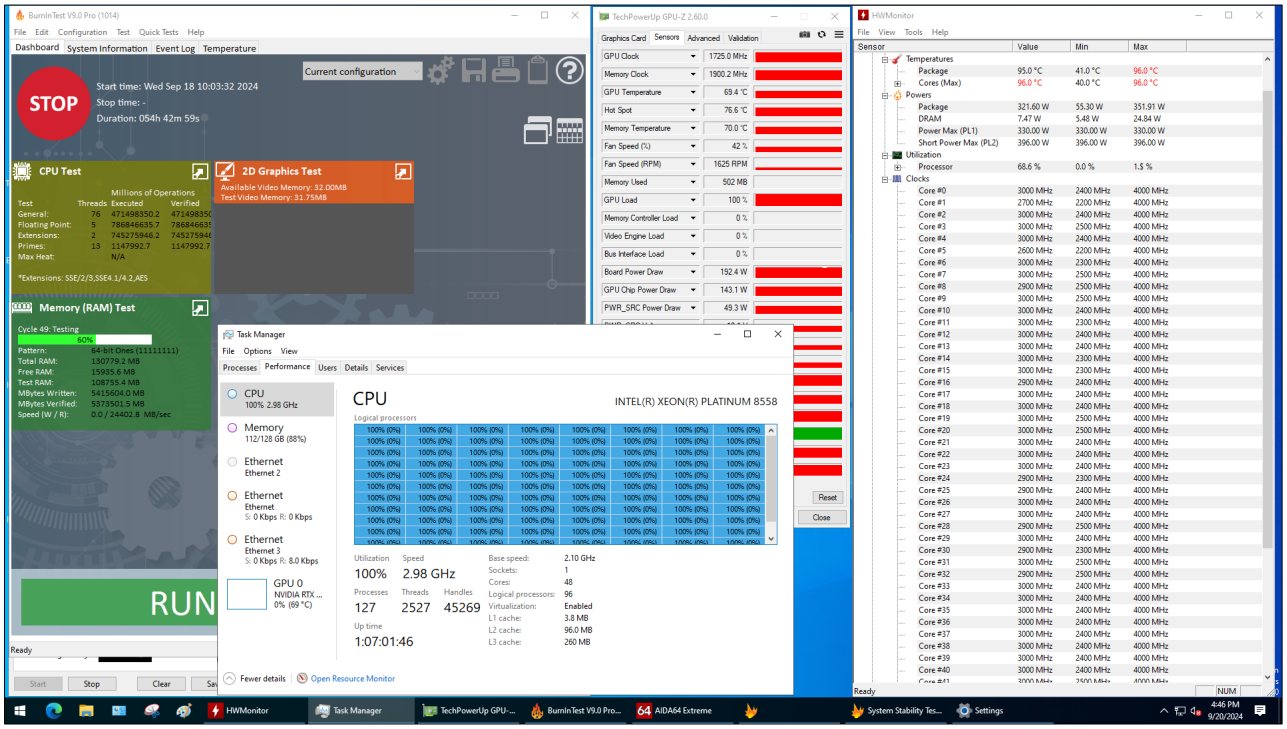
- Chamber in 30°C / 60%RH



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

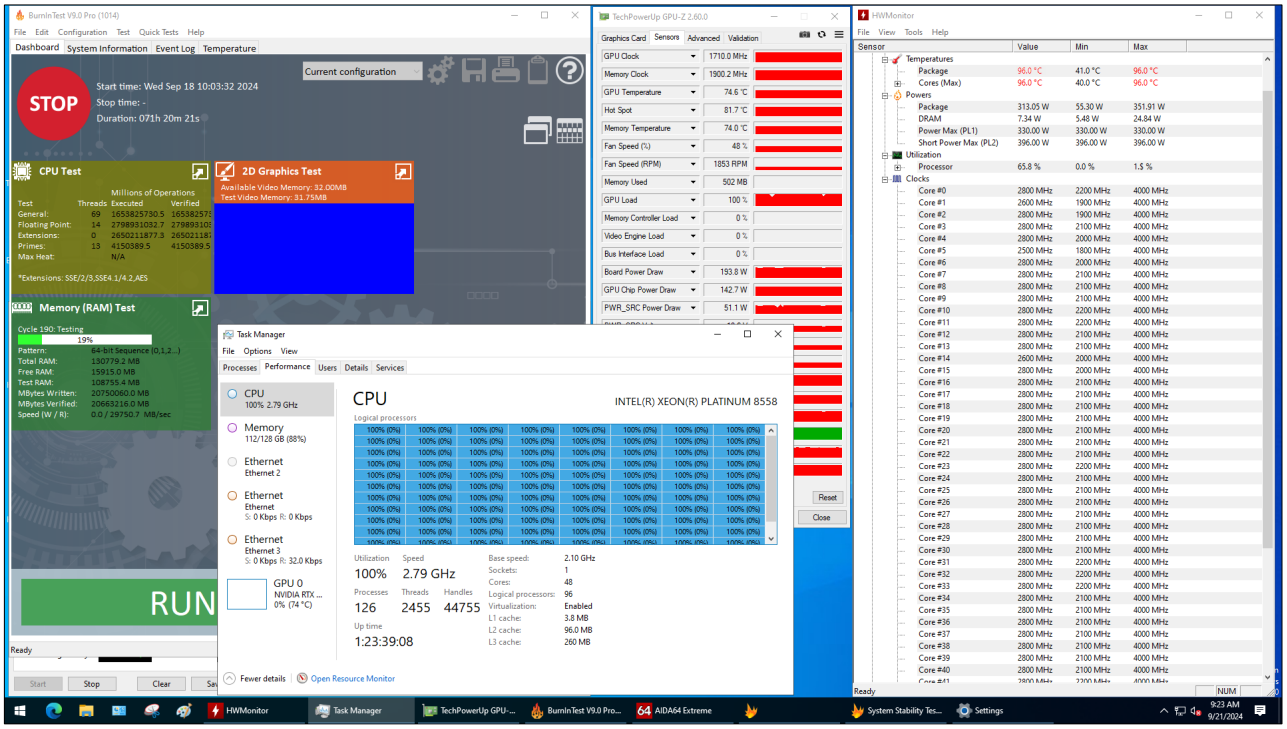
- Chamber in 35°C / 60%RH



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

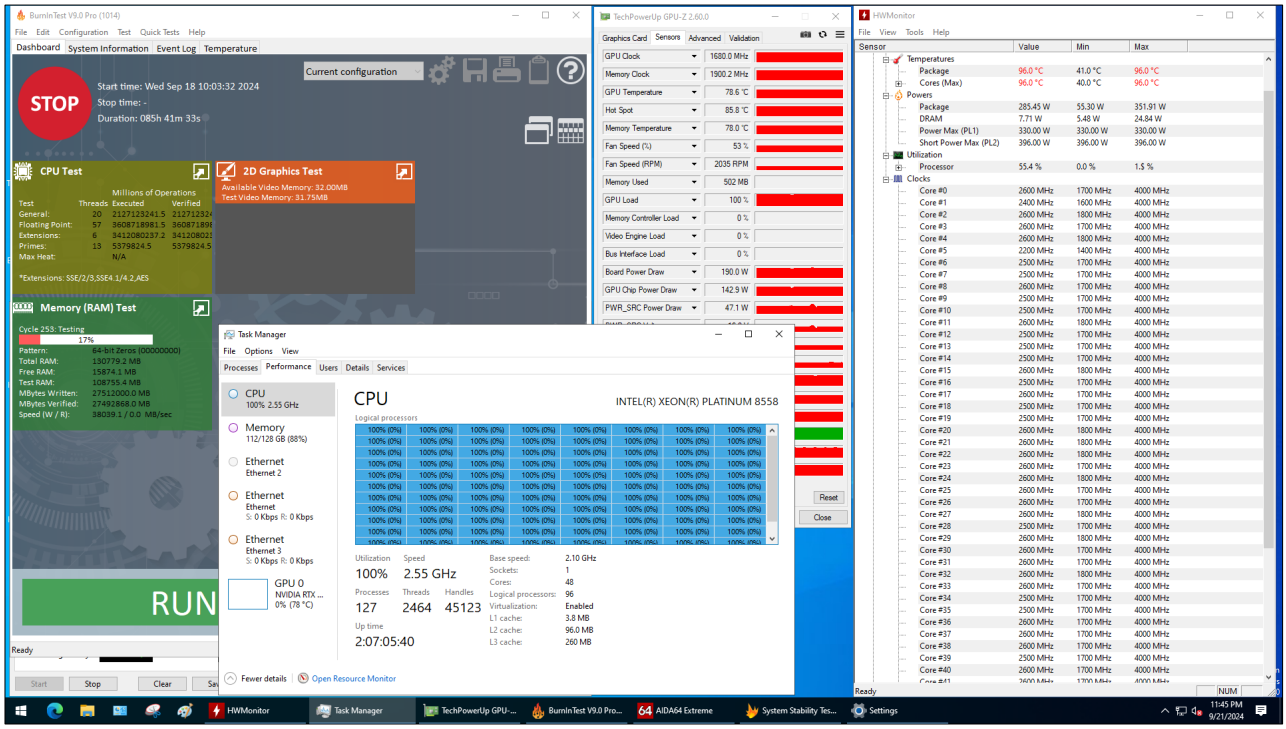
- Chamber in 40°C / 60%RH



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

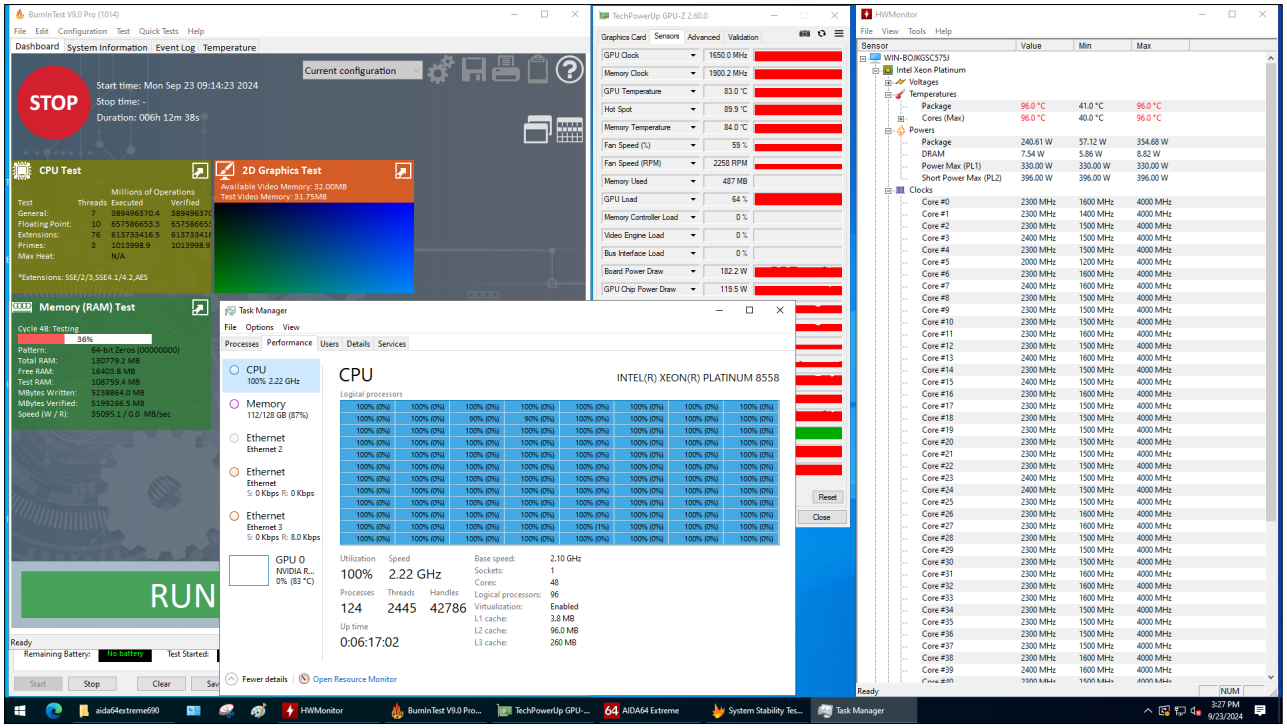
- Chamber in 45°C / 60%RH



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

- Chamber in 50°C / 60%RH



5. THERMAL TEST RESULT(25˚C ~ 50˚C)

Configure A: CPU Xeon Gold 5420 + (205W) / GPU A4500 Temperature and Frequency

Temperature / Ambient Temp. / Frequency	25°C 60% RH	30°C 60% RH	35°C 60% RH	40°C 60% RH	45°C 60% RH	50°C 60% RH
CPU Cores Max Temperature (Unit: °C)	68.0	70.0	77.0	83.0	89.0	93.0
CPU Cores Frequency (Unit: GHz) Processor Base Frequency: 2.00 GHz	2.70	2.70	2.70	2.70	2.70	2.70
GPU Temperature (Unit: °C)	66.3	69.8	72.9	76.9	80.7	85.3
GPU Hot Spot Temperature (Unit: °C)	73.3	77.2	80.4	84.2	88.0	92.8
GPU Frequency (Unit: MHz) GPU Base Frequency: 1050MHz	1755	1725	1710	1695	1665	1650

Configure B: CPU Xeon Platinum 8558 (330W) / GPU A4500 Temperature and Frequency

Temperature / Ambient Temp. / Frequency	25°C 60% RH	30°C 60% RH	35°C 60% RH	40°C 60% RH	45°C 60% RH	50°C 60% RH
CPU Cores Max Temperature (Unit: °C)	85.0	90.0	96.0	96.0	96.0	96.0
CPU Cores Frequency (Unit: GHz) Processor Base Frequency: 2.10 GHz	3.00	3.00	3.00	2.80	2.60	2.30
GPU Temperature (Unit: °C)	62.4	65.9	69.4	74.6	78.6	83.0
GPU Hot Spot Temperature (Unit: °C)	69.0	72.9	76.6	81.7	85.8	89.9
GPU Frequency (Unit: MHz) GPU Base Frequency: 1050MHz	1755	1740	1725	1710	1680	1650

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